U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Pyrgulopsis gilae*

COMMON NAME: Gila springsnail

LEAD REGION: Region 2

INFORMATION CURRENT AS OF: October 2005

STATUS/ACTION:

___ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
___ Non-petitioned
_X_ Petitioned - Date petition received: 11/20/85
_X_ 90-day positive - FR date: 8/20/86
_X_ 12-month warranted but precluded - FR date: 10/4/88
___ Did the petition requesting a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? Yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.
We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements; meeting statutory deadlines for petition findings or listing determinations; emergency listing evaluations and determinations; and essential litigation-related administrative and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (http://endangered.fws.gov/).
___ Listing priority change
Former LP: ___
New LP: ___
Date when the species first became a Candidate (as currently defined): 10/4/88

___ Candidate removal: Former LP: ___

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Mollusca, Hydrobiidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: New Mexico

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Grant and Catron counties, New Mexico

LAND OWNERSHIP: Federal (U. S. Forest Service), 90 percent; Private, 10 percent

LEAD REGION CONTACT: Susan Jacobsen, 505-248-6641

LEAD FIELD OFFICE CONTACT: New Mexico Ecological Services Field Office, Marilyn Myers, 505-761-4754; Eric Hein 505-761-4735

BIOLOGICAL INFORMATION:

Species Description: The Gila springsnail is an entirely aquatic species, with an ovate-conic tan shell of medium to large size (3.1 - 4.0 mm). Most freshwater gastropods are herbivores or detritivores that consume algae, bacteria, and decaying organic material, or that passively ingest small invertebrates while feeding. Respiration in hydrobiid snails is strictly aquatic via an internal gill with some oxygen absorption through the mantle (soft body). Hydrobiid snails are sexually dimorphic, and females are characteristically larger and live longer than males. Most of these snails reproduce several times during the breeding period (spring-fall) with varying degrees of replacement of generations. While longevity is variable, most prosobranch snails (snails that have gills and an operculum) live 9 to 15 months (Taylor 1987, Pennak 1989, Brown 1991).

Taxonomy: The Gila springsnail is a prosobranch snail of the freshwater family Hydrobiidae. Hydrobiid snails are distinguished by the presence of eyes on long antennae and a globular to narrowly conical shell (Taylor 1987). The tan shells of the Gila springsnail are ovoid with a convex spire longer than most other *Pyrgulopsis* species in New Mexico (New Mexico

Department of Game and Fish 2002). The species also has distinctive penial morphology that includes a horseshoe-shaped terminal gland (Taylor 1987). The species is morphologically and genetically distinct from other *Pyrgulopsis* species in the Colorado River basin, including the New Mexico springsnail (Hurt 2004). A recent study found that the population of Gila springsnail at Wall Spring on the Gila National Forest is both geographically and genetically distinct from other Gila springsnail populations (Hurt 2004).

Habitat/Distribution: The Gila springsnail is known from thirteen populations in Catron and Grant counties, New Mexico. All known populations occur on U.S. Forest Service lands and private lands within the boundaries of the Gila National Forest. Two populations are found along Beaver Creek and Taylor Creek, which form the headwaters of the East Fork Gila River. A separate population occupies Fall Spring. The remaining eight disjunct populations are associated with a series of springs along the East Fork, Middle Fork, and mainstem of the Gila River (U.S. Forest Service 2004). The most distant springsnail populations are approximately 10 to 12 miles downstream of one another along the East Fork of the Gila River (U.S. Forest Service 2004). The Gila springsnail co-occurs at the two localities with the federal candidate New Mexico springsnail (*Pyrgulopsis thermalis*), although the two species are typically segregated to cool and warm water microhabitats, respectively (Stefferud 1986). Both species occur in thermal waters, yet Gila springsnails do not inhabit the warm waters of the New Mexico springsnail's vertical rock habitat.

At the type locality on the East Fork of the Gila River, the Gila springsnail inhabits cool waters (20°C (68°F)) that issue from narrow, watercress-lined rivulets of a vertical rhyolitic cliff that Taylor (1987) termed "hanging springs." A second, smaller Gila springsnail population exists in the warmer waters (32 to 33° C (89.6 to 91°F)) of a nearby spring (Landye 1981, Taylor 1987). Mehlhop (1993) reported Gila springsnail populations occupying small (10 to 25 square meters (12 to 30 square yards)), eurythermal (14 to 27° C (57 to 81°F)) habitats ranging from highly degraded to relatively undisturbed thermal springs It is unknown how populations are affected in degraded habitats.

Most freshwater gastropods are herbivorous or detritivores that consume algae, bacteria, and decaying organic material, or that passively ingest small invertebrates while feeding. Respiration in hydrobiid snails is strictly aquatic via an internal gill with some oxygen absorption through the mantle (soft body). Hydrobiid snails are sexually dimorphic, and females are characteristically larger and live longer than males. Most prosobranch snails are annual species that reproduce several times during the breeding period (spring-fall) with varying degrees of replacement of generations. While longevity is variable, most prosobranch snails live 9 to 15 months (Taylor 1987, Pennak 1989, Brown 1991).

Population Estimates/Status: Melhop (1992, 1993) reported on the status of hydrobiid snails in the Gila River. Although density estimates are not currently known for the species, populations of the Gila springsnail were reported as stable in October 2001 and June 2002 (New Mexico Department of Game and Fish 2002). Still, the springsnail exhibits seasonal variation in numbers and occurs in patchy distributions within the thirteen populations. The long-term persistence of the Gila springsnail is considered to be contingent upon protection of the riparian corridor immediately adjacent to springhead and springrun habitats, thereby ensuring the

maintenance of perennial, oxygenated flowing water within the species' required thermal range (Lang 1998, Taylor 1987, Mehlhop 1996, Mehlhop and Vaughan 1994, U.S. Forest Service 2004). In 2006, the U.S. Forest Service will conduct surveys to estimate density for populations of Gila springsnail (U.S. Fish and Wildlife Service 2005a). These results will be reported annually to determine the species' trend and persistence.

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range. While Gila springsnail populations in the Gila National Forest may be stable, sites on both private and federal lands may be are subject to recreational use and livestock grazing at levels that negatively affect the species (Mehlhop 1993), thus rendering the long-term survival of the Gila springsnail questionable. Sites inhabited by the species are subject to recreational use that may result in reductions in water quality, increased sedimentation, reduced spring flow, and temperature changes (Mehlhop 1993, U.S. Forest Service 2004). For example, the impacts of recreational use have been documented at two of the localities of Gila springsnails, one of which is adjacent to a developed hiking trail (U.S. Forest Service 2004, U.S. Fish and Wildlife Service 2005a). The use of occupied localities by bathers and recreationists has also been identified as disrupting water flow and correlated with localized absence of the species (New Mexico Department of Game and Fish 2002, U.S. Forest Service 2004, U.S. Fish and Wildlife Service 2005). Such physical disturbance and potential for water contamination may limit the species' ability to re-colonize the spring run from up-gradient source populations where the species is more abundant (U.S. Forest Service 2004). Nevertheless, springsnail populations appear to be stable (New Mexico Department of Game and Fish 2002).

Livestock grazing in and near the springs can also have an impact on the quality of springsnail habitat. Livestock use can result in the degradation and contamination of thermal springs (New Mexico Department of Game and Fish 2002, U.S. Forest Service 2004). Livestock grazing is uncontrolled on private lands and can directly impact the Gila springsnail through trampling, and contamination and degradation of springs (Mehlhop 1993, New Mexico Department of Game and Fish 2002). The direct impacts of livestock grazing on the springsnail is currently minimized from fencing of all occupied localities on U.S. Forest Service lands, but livestock grazing may still have an indirect affect. For example, livestock grazing on the Gila National Forest can indirectly impact Gila springsnails through the alteration of watersheds and spring habitats (U.S. Fish and Wildlife Service 2005a).

Springsnail habitat can be degraded by recreationists, livestock grazing near the thermal springs, or poor watershed management practices (Lang 1998, Taylor 1987, New Mexico Department of Game and Fish 1988, Mehlhop 1993, U.S. Forest Service 2004, U.S. Fish and Wildlife Service 2005a). Recreational use of springs where the species is found result in increased sedimentation, reductions in water quality, reduced spring flow, and temperature changes. All of these impacts have the potential to negatively affect Gila springsnail populations and result in local extirpations (Taylor 1987, New Mexico Department of Game and Fish 1988, Mehlhop 1993, Lang 1998, U.S. Forest Service 2004, U.S. Fish and Wildlife Service 2005a).

Historic fire data that shows wildfires in the southwest have become increasingly larger and more intense (U.S. Forest Service 2004). Several high-intensity fires have burned within the

Gila National Forest in the last decade (U.S. Fish and Wildlife Service 2005b). In 2003, over 200,000 acres burned in the Gila National Forest (U.S. Fish and Wildlife Service 2005b). Tree density and accumulation of dead, woody debris has increased on National Forest System lands (U.S. Forest Service 2004). However, the primary reason for the current intensity of fires is drought. Human-caused fires often contribute to the larger and more intense fires because they tend to occur during drier periods of the year (U.S. Forest Service 2004). Catastrophic fire is one of the primary threats to the Gila springsnail and its habitat (e.g., burning riparian areas and subsequent ash and sediment flow into habitats) (U.S. Fish and Wildlife Service 2005a). Chemical retardants used to suppress fires are toxic to aquatic species (McDonald and Hamilton 1995). In addition, large amounts of ash resulting from forest fires can alter nutrient levels within the spring systems, affecting the amount of dissolved oxygen available to springsnails. Such impacts have the potential to negatively affect springsnail populations and result in local extirpations. While there have been no instances of chemical retardant releases in the immediate area of these thermal springs, the inadvertent dropping of fire retardant in these springs would cause direct mortality to the springsnail. However, in 2003, fire retardant was dropped on Black Canyon, Gila National Forest, affecting approximately 200 m (218 yards) of stream (U.S. Fish and Wildlife Service 2005b).

With increasing frequency and severity of wildfires in the Gila National Forest, contamination of spring areas due to retardant chemicals used for fire suppression, as well as large amounts of ash resulting from forest fires, is a growing concern that may potentially have deleterious effects on this species. Large amounts of ash add nutrients to spring systems that can alter the balance between algae and invertebrate communities. Significant increases in algae can change the amount of dissolved oxygen available to springsnails and other invertebrates. Lang (New Mexico Department of Game and Fish, pers. comm., 2001) noted decreases in numbers of rare springsnail species on Bitter Lake National Wildlife Refuge in eastern New Mexico following a wildfire. We would expect similar effects to the Gila springsnail if a wildfire burned near occupied habitat. These factors, when combined with natural events such as drought, fire, sedimentation, and recreational use may further imperil populations (McDonald and Hamilton 1995, New Mexico Department of Game and Fish 2002, U.S. Forest Service 2004, U.S. Fish and Wildlife Service 2005a).

B. Overutilization for commercial, recreational, scientific, or educational purposes. Not known to be a factor threatening the Gila springsnail.

C. Disease or predation. Not known to be a factor threatening the Gila springsnail.

D. The inadequacy of existing regulatory mechanisms. The Gila springsnail is listed as a New Mexico State endangered species, Group 2, which are those species "...whose prospects of survival or recruitment within the state are likely to become jeopardized in the near future" (New Mexico Department of Game and Fish 1988). This designation provides the protection of the New Mexico Wildlife Conservation Act and prohibits taking of such species except under issuance of a scientific collecting permit. However, the law does not provide for habitat protection. Because most of the threats to the species are from effects to habitat, protecting individuals from taking will not, by itself, ensure the long-term protection of the species.

The U.S. Forest Service has classified the Gila springsnail as a sensitive species. The standards and guidelines listed in the Gila National Forest Land and Resource Management Plan (LRMP) provide direction for the development of site-specific actions (U.S. Forest Service 1986). Multiple standards and guidelines within this LRMP are applicable to the Gila springsnail and its spring habitat. For example, standards and guidelines can minimize the negative effect of range improvement projects on Gila springsnails located within non-wilderness areas. Even when U.S. Forest Service projects follow the standards and guidelines from the Gila National Forest LRMP, both indirect and direct effects to the species may result. U.S. Forest Service management on the Gila National Forest may potentially impact Gila springsnails and their habitats by alterations to springs, riparian areas, upland watersheds, and groundwater; as well as direct impacts to the springsnail. More importantly, no forest-wide standards and guidelines specifically address the conservation or protection of the species.

We recently concluded that recreational use at one of the populations is likely to kill, harm,and harass the species (U.S. Fish and Wildlife Service 2005a). We found that there are no specific standards and guidelines within the Gila National Forest LRMP that regulate recreation-related activities in wilderness areas (U.S. Fish and Wildlife Service 2005a). Although management guidance included in the Gila National Forest LRMP permits the relocation of trails for resource protection, it does not ensure protection of Gila springsnail habitat in wilderness areas from the adverse effects associated with allowed recreational activities (U.S. Forest Service 2004, U.S. Fish and Wildlife Service 2005a). Additionally, we are reasonably certain that prescribed fires are likely to harm Gila springsnails (U.S. Fish and Wildlife Service 2005a). These activities disrupt watershed function and degrade water quality. The alteration and destruction of spring habitat is likely to impair essential behavior patterns of the Gila springsnail.

E. Other natural or manmade factors affecting its continued existence. The geographically restricted distribution of the Gila springsnail makes the species vulnerable to human-caused or natural events that could eliminate the species. Because populations of the Gila springsnail are limited to 13 small areas, randomly occurring events such as floods, severe droughts, contamination events, or fires could result in the extirpation of one or several populations. Reduced population numbers and localities may result in decreased genetic diversity and increases in vulnerability to extinction due to further randomly occurring events. For example, prolonged drought leading to diminishment or drying of thermal springs would have a negative impact on the Gila springsnail. New Mexico has been in a drought since 1999. The length or severity of the current drought cycle is not known and the Southwest may be entering a period of prolonged drought (MaCabe et al. 2004). Drought impacts both surface and groundwater resources and can lead to diminished water quality and disturbed riparian habitats (Woodhouse and Overpeck 1998; MacRae et al. 2001). The thermal springs do not have to dry out completely to have an adverse effect on populations of springsnails. Decreased spring flow could lead to a decrease in habitat availability, water temperature fluctuations, lower dissolved oxygen levels, and an increase in salinity (MacRae et al. 2001). Any of these factors, alone or in combination, could lead either to the reduction or extirpation of a population. Any perturbation, either natural (e.g., drought) or anthropogenic (e.g., water contamination), has the potential to eliminate many or all of the existing populations. Having a high number of individuals at a site provides no protection against extinction, because springsnails could easily be extirpated from a locality when a thermal spring dries.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED: Previous attempts in the 1980s to develop a conservation agreement for the Gila springsnail and the New Mexico springsnail with the U.S. Forest Service and the New Mexico Department of Game and Fish were not successful. Currently, all occupied Gila springsnail sites are excluded from livestock grazing. Excluding livestock from riparian areas, particularly thermal springs, helps maintain springsnail habitat and protect water quality.

SUMMARY OF THREATS: Occupied Gila springsnail localities on private and Federal lands are subject to moderate levels of recreational use that may result in reductions in water quality, increased sedimentation, reduced spring flow, and fluctuations in temperatures. Habitat degradation by recreational use and livestock grazing near the thermal springs and/or inadequate watershed management practices represent threats to the Gila springsnail. Additionally, catastrophic fire has been identified as a primary threat to the Gila springsnail and its habitat. However, of greater concern is the current drought, which could impact thermal spring discharge. Significant fires have occurred in the Gila National Forest and subsequent floods and ash flows have severely impacted aquatic life in streams. If the drought continues or worsens, the imminence of threats (e.g., decreased discharge, fire) will increase.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES:

- Develop a Management Plan to address impacts to springsnails from recreational activities.
- In coordination with federal and state conservation agencies, implement a monitoring plan to survey for Gila springsnails.
- The Service should work with the U.S. Forest Service to develop a Candidate Conservation Agreement to protect Gila springsnails.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6

Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	**11***
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: Use of the springs by recreationalists, catastrophic wildfire, and drought are the most significant threats. Although the localities of the Gila springsnail are affected by the threats described above, the magnitude of the threat to the species is moderate because populations of the Gila springsnail appear to be stable. Because several of the springs occur on private land, management options for the protection of the springsnail are limited. Still, the threats are magnified because of its very limited distribution (13 populations).

Imminence: Moderate use by recreationalists is ongoing. If use by these groups remains at current or lower levels, they do not pose an imminent threat because populations appear to be stable. Of greater concern is the current drought which could impact spring discharge and increase the potential for fire. Catastrophic fires have occurred in the Gila National Forest and subsequent floods and ash flows have significantly impacted aquatic life in streams (Brown et al. 2001). We would expect similar effects to the Gila springsnail if a wildfire burned near occupied habitat. If the drought continues or worsens, the imminence of threats (e.g., decreased discharge, fire) will increase.

__X__ Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed? Yes.

Is Emergency Listing Warranted? No. Although the drought has continued, Gila springsnail populations have not yet been impacted by either fire or decreased discharge. It appears that recreational use and livestock grazing are at levels compatible with the continued existence of the species. Indications are that the populations are stable at this time.

DESCRIPTION OF MONITORING: The New Mexico Department of Game and Fish has been the agency monitoring the populations of the Gila springsnail. The type locality was monitored in October 2001 and June 2002. Although density estimates are not currently known for the species, populations of the Gila springsnail were reported as stable (New Mexico Department of Game and Fish 2002). In 2003, Carla Hurt, Arizona State University, collected the species from spring-fed tributaries to the East Fork Gila River, where Mehlhop (1993) first documented the species. A routine monitoring protocol has not been established; however, the U.S. Forest Service will begin annual population monitoring 2006 to evaluate population persistence (U.S. Fish and Wildlife Service 2005a). This process will develop a monitoring protocol.

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: New Mexico Department of Game and Fish

Indicate which State(s) did not provide any information or comments: NA

LITERATURE CITED

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: /s/ Rich McDonald 11/17/2005
Acting Regional Director, Fish and Wildlife Service Date

Concur: August 23, 2006
Director, Fish and Wildlife Service Date

Do not concur:
Director, Fish and Wildlife Service Date

Date of annual review: October 2005
Conducted by: Marilyn Myers/Eric Hein